# Safety Data Sheet
## according to OSHA HCS

Printing date 07/16/2021 Reviewed on 07/16/2021

## 1 Identification

· **Product name**

· **Trade name: Tri-n-butylphosphine, min. 93%**

· **Item number:** 15-5801
· **CAS Number:**
998-40-3
· **EC number:**
213-651-2

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Strem Chemicals, Inc.
7 Mulliken Way
NEWBURYPORT, MA 01950
USA
info@strem.com

· **Information department:** Technical Department
· **Emergency telephone number:**
EMERGENCY: CHEMTREC: + 1 (800) 424-9300
During normal opening times: +1 (978) 499-1600

## 2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS02 Flame

| | | |
|---|---|---|
| Flam. Liq. 2 | H225 | Highly flammable liquid and vapor. |
| Pyr. Liq. 1 | H250 | Catches fire spontaneously if exposed to air. |
| Self-heat. 2 | H252 | Self-heating in large quantities; may catch fire. |

GHS07

| | | |
|---|---|---|
| Acute Tox. 4 | H302 | Harmful if swallowed. |
| Acute Tox. 4 | H312 | Harmful in contact with skin. |
| Acute Tox. 4 | H332 | Harmful if inhaled. |
| Skin Irrit. 2 | H315 | Causes skin irritation. |
| Eye Irrit. 2A | H319 | Causes serious eye irritation. |
| STOT SE 3 | H335 | May cause respiratory irritation. |

· **Label elements**
· **GHS label elements**
The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS02 GHS07

· **Signal word** Danger

(Contd. on page 2)

# Safety Data Sheet
## according to OSHA HCS

Printing date 07/16/2021 Reviewed on 07/16/2021

**Trade name: Tri-n-butylphosphine, min. 93%**

(Contd. of page 1)

· **Hazard-determining components of labeling:**
tributylphosphine
· **Hazard statements**

| | |
|---|---|
| H225 | Highly flammable liquid and vapor. |
| H250 | Catches fire spontaneously if exposed to air. |
| H252 | Self-heating in large quantities; may catch fire. |
| H302+H312+H332 | Harmful if swallowed, in contact with skin or if inhaled. |
| H315 | Causes skin irritation. |
| H319 | Causes serious eye irritation. |
| H335 | May cause respiratory irritation. |

· **Precautionary statements**

| | |
|---|---|
| P231 | Handle under inert gas. |
| P301+P310 | IF SWALLOWED: Immediately call a POISON CENTER/ doctor. |
| P305+P351+P338 | If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P422 | Store contents under inert gas. |
| P501 | Dispose of contents/container in accordance with local/regional/national/international regulations. |

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**


Health = 4
Fire = 4
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**


Health = 4
Fire = 4
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

## 3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
998-40-3 tributylphosphine
· **Identification number(s)**
· **EC number:** 213-651-2

## 4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

(Contd. on page 3)

# Safety Data Sheet
according to OSHA HCS



**Trade name: Tri-n-butylphosphine, min. 93%**

(Contd. of page 2)

· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** Immediately call a doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

## 5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

## 6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Prevent seepage into sewage system, workpits and cellars.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

| · **PAC-1:** |
|---|
| 0.27 ppm |

| · **PAC-2:** |
|---|
| 3 ppm |

| · **PAC-3:** |
|---|
| 18 ppm |

## 7 Handling and storage

· **Handling:** Handle under inert gas.
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.

(Contd. on page 4)

# Safety Data Sheet
## according to OSHA HCS



**Trade name: Tri-n-butylphosphine, min. 93%**

(Contd. of page 3)

*Prevent formation of aerosols.*
· ***Information about protection against explosions and fires:***
*Keep ignition sources away - Do not smoke.*
*Protect against electrostatic charges.*
*Keep respiratory protective device available.*

· ***Conditions for safe storage, including any incompatibilities***
· ***Storage:*** *Store contents under inert gas.*
· ***Requirements to be met by storerooms and receptacles:*** *Store in a cool location.*
· ***Information about storage in one common storage facility:*** *Not required.*
· ***Further information about storage conditions:***
*Keep receptacle tightly sealed.*
*Store in cool, dry conditions in well sealed receptacles.*
· ***Specific end use(s)*** *No further relevant information available.*

## 8 Exposure controls/personal protection

· ***Additional information about design of technical systems:*** *No further data; see item 7.*

· ***Control parameters***
· ***Components with limit values that require monitoring at the workplace:*** *Not required.*
· ***Additional information:*** *The lists that were valid during the creation were used as basis.*

· ***Exposure controls***
· ***Personal protective equipment:***
· ***General protective and hygienic measures:***
*Keep away from foodstuffs, beverages and feed.*
*Immediately remove all soiled and contaminated clothing.*
*Wash hands before breaks and at the end of work.*
*Store protective clothing separately.*
*Avoid contact with the eyes and skin.*
· ***Breathing equipment:*** *A NIOSH approved respirator in accordance with 29 CFR 1910.134.*
· ***Protection of hands:***

*Protective gloves*

*The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.*
*Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.*
*Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation*
· ***Material of gloves***
*The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.*
· ***Penetration time of glove material***
*The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.*

(Contd. on page 5)

# Safety Data Sheet
according to OSHA HCS



**Trade name: Tri-n-butylphosphine, min. 93%**

(Contd. of page 4)

· **Eye protection:**

Tightly sealed goggles

## 9 Physical and chemical properties

| | |
|---|---|
| · **Information on basic physical and chemical properties** | |
| · **General Information** | |
| · **Appearance:** | |
| **Form:** | Liquid |
| **Color:** | Light yellow |
| · **Odor:** | Pungent |
| · **Odor threshold:** | Not determined. |
| · **pH-value:** | Not determined. |
| · **Change in condition** | |
| **Melting point/Melting range:** | Undetermined. |
| **Boiling point/Boiling range:** | 240 °C (464 °F) |
| · **Flash point:** | Not applicable. |
| · **Flammability (solid, gaseous):** | Not determined. |
| · **Ignition temperature:** | 168 °C (334 °F) |
| · **Decomposition temperature:** | Not determined. |
| · **Auto igniting:** | Spontaneously flammable in air. |
| · **Danger of explosion:** | Product is not explosive. However, formation of explosive air/vapor mixtures are possible. |
| · **Explosion limits:** | |
| **Lower:** | Not determined. |
| **Upper:** | Not determined. |
| · **Vapor pressure at 150 °C (302 °F):** | 667 hPa (500 mm Hg) |
| · **Density at 20 °C (68 °F):** | 0.817 g/cm³ (6.81787 lbs/gal) |
| · **Relative density** | Not determined. |
| · **Vapor density** | Not determined. |
| · **Evaporation rate** | Not determined. |
| · **Solubility in / Miscibility with** | |
| **Water:** | Not miscible or difficult to mix. |
| · **Partition coefficient (n-octanol/water):** | Not determined. |
| · **Viscosity:** | |
| **Dynamic:** | Not determined. |
| **Kinematic:** | Not determined. |
| · **Solvent content:** | |
| **Organic solvents:** | 0.0 % |
| **VOC content:** | 0.0 g/l / 0.00 lb/gl |

(Contd. on page 6)

# Safety Data Sheet
according to OSHA HCS

Printing date 07/16/2021 Reviewed on 07/16/2021

**Trade name: Tri-n-butylphosphine, min. 93%**

(Contd. of page 5)

· **Other information** No further relevant information available.

## 10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

## 11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

| · **LD/LC50 values that are relevant for classification:** | | |
|---|---|---|
| **998-40-3 tributylphosphine** | | |
| Oral | LD50 | 750 mg/kg (rat) |
| Dermal | LD50 | 2000 mg/kg (rabbit) |

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**

· **Carcinogenic categories**

| · **IARC (International Agency for Research on Cancer)** |
|---|
| Substance is not listed. |

| · **NTP (National Toxicology Program)** |
|---|
| Substance is not listed. |

| · **OSHA-Ca (Occupational Safety & Health Administration)** |
|---|
| Substance is not listed. |

## 12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Not known to be hazardous to water.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

(Contd. on page 7)

# Safety Data Sheet
according to OSHA HCS



**Trade name: Tri-n-butylphosphine, min. 93%**

(Contd. of page 6)

· **Other adverse effects** No further relevant information available.

## 13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

## 14 Transport information

| | |
|---|---|
| · **UN-Number** | |
| · **DOT, IMDG, IATA** | UN2845 |
| · **UN proper shipping name** | |
| · **DOT** | Pyrophoric liquids, organic, n.o.s. |
| · **IMDG, IATA** | PYROPHORIC LIQUID, ORGANIC, N.O.S. |
| · **Transport hazard class(es)** | |
| · **DOT** | |


| | |
|---|---|
| · **Class** | 4.2 Substances liable to spontaneous combustion |
| · **Label** | 4.2 |
| · **IMDG, IATA** | |


| | |
|---|---|
| · **Class** | 4.2 Substances liable to spontaneous combustion |
| · **Label** | 4.2 |
| · **Packing group** | |
| · **DOT, IMDG, IATA** | I |
| · **Environmental hazards:** | |
| · **Marine pollutant:** | No |
| · **Special precautions for user** | Not applicable. |
| · **EMS Number:** | F-G,S-M |
| · **Stowage Category** | D |
| · **Handling Code** | H1 Keep as dry as reasonably practicable |

(Contd. on page 8)

# Safety Data Sheet
## according to OSHA HCS



**Trade name: Tri-n-butylphosphine, min. 93%**

(Contd. of page 7)

| | |
|---|---|
| · **Segregation Code** | SG26 In addition: from goods of classes 2.1 and 3 when stowed on deck of a containership a minimum distance of two container spaces athwartship shall be maintained, when stowed on ro-ro ships a distance of 6 m athwartship shall be maintained.<br>SG63 Stow "separated longitudinally by an intervening complete compartment or hold from" Class 1. |
| · **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** | Not applicable. |
| · **Transport/Additional information:** | |
| · **DOT** | |
| · **Quantity limitations** | On passenger aircraft/rail: Forbidden<br>On cargo aircraft only: Forbidden |
| · **IMDG** | |
| · **Limited quantities (LQ)** | 0 |
| · **Excepted quantities (EQ)** | Code: E0<br>Not permitted as Excepted Quantity |
| · **UN "Model Regulation":** | UN 2845 PYROPHORIC LIQUIDS, ORGANIC, N.O.S., 4.2, I |

## 15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is not listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**
Substance is not listed.

· **TLV (Threshold Limit Value established by ACGIH)**
Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

(Contd. on page 9)

# Safety Data Sheet
## according to OSHA HCS



**Trade name: Tri-n-butylphosphine, min. 93%**

(Contd. of page 8)

· **GHS label elements**
The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS02 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
tributylphosphine
· **Hazard statements**

| | |
|---|---|
| H225 | Highly flammable liquid and vapor. |
| H250 | Catches fire spontaneously if exposed to air. |
| H252 | Self-heating in large quantities; may catch fire. |
| H302+H312+H332 | Harmful if swallowed, in contact with skin or if inhaled. |
| H315 | Causes skin irritation. |
| H319 | Causes serious eye irritation. |
| H335 | May cause respiratory irritation. |

· **Precautionary statements**

| | |
|---|---|
| P231 | Handle under inert gas. |
| P301+P310 | IF SWALLOWED: Immediately call a POISON CENTER/ doctor. |
| P305+P351+P338 | If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P403+P233 | Store in a well-ventilated place. Keep container tightly closed. |
| P422 | Store contents under inert gas. |
| P501 | Dispose of contents/container in accordance with local/regional/national/international regulations. |

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

## 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** Technical Department.
· **Contact:** Technical Director
· **Date of preparation / last revision** 07/16/2021 / -
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health

(Contd. on page 10)

# Safety Data Sheet
## according to OSHA HCS

*Printing date 07/16/2021* *Reviewed on 07/16/2021*

**Trade name: Tri-n-butylphosphine, min. 93%**

(Contd. of page 9)

*TLV: Threshold Limit Value*
*PEL: Permissible Exposure Limit*
*REL: Recommended Exposure Limit*
*Flam. Liq. 2: Flammable liquids – Category 2*
*Pyr. Liq. 1: Pyrophoric liquids – Category 1*
*Self-heat. 2: Self-heating substances and mixtures – Category 2*
*Acute Tox. 4: Acute toxicity – Category 4*
*Skin Irrit. 2: Skin corrosion/irritation – Category 2*
*Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A*
*STOT SE 3: Specific target organ toxicity (single exposure) – Category 3*